

10.12: Radical Equations

- A radical equation is an equation involving a root(s) of a variable

Ex: Solve for x : $x = 1 + \sqrt{x+5}$

Process: Solving $\sqrt{\quad}$ equations

1) Get $\sqrt{\quad}$ by itself

2) Square both sides

3) Solve resulting equation

• if quadratic solve by (i) Factoring

or (ii) quad. eq:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

4) Check soln(s) into original $\sqrt{\quad}$ eq.

Ex: Solve for x : $3\sqrt{x-2} = 2\sqrt{x+8}$

Chapter 10.pdf - Adobe Reader
File Edit View Window Help

51 / 56 150%

Tools Comment

EXERCISES

In 1–42, solve each radical equation and check.

1. $\sqrt{x} = 3$	2. $\sqrt{3x} = 6$	3. $3\sqrt{x} = 6$
4. $\sqrt{6x} = 3$	5. $\sqrt[3]{y} = 4$	6. $\sqrt[3]{2x} = -2$
7. $\sqrt{2x} = -2$	8. $7 + \sqrt{x} = 13$	9. $5 + \sqrt{y} = 3$
10. $\sqrt{y-6} = 2$	11. $\sqrt{y+8} = 4$	12. $\sqrt{5+y} = 3$
13. $\sqrt{4-x} = 3$	14. $\sqrt{2x+3} = 7$	15. $\sqrt{9-2k} = 5$
16. $4 - \sqrt{x} = 7$	17. $\sqrt{2y+5} = -3$	• 18. $x = \sqrt{6x+7}$
19. $y = \sqrt{6y+16}$	20. $x = \sqrt{x}$	• 21. $y = 2\sqrt{2y-3}$
22. $x = 2\sqrt{3-x}$	23. $y-2 = \sqrt{y}$	• 24. $x-3 = 2\sqrt{x}$
25. $\sqrt{x^2+13} = x+1$	26. $\sqrt{x^2-12} = x-2$	• 27. $y-3 = \sqrt{y^2+3y}$
28. $5 + \sqrt{4y-3} = 2$	29. $x-1 = \sqrt{5x-9}$	• 30. $x+2 = \sqrt{3x+16}$
31. $\sqrt{2-2y} = y+3$	32. $y = 3 + \sqrt{30-2y}$	• 33. $x = 4 + \sqrt{2x-8}$
34. $3x = 2\sqrt{3x-1}$	35. $\sqrt{5k-3} = \sqrt{k+13}$	• 36. $\sqrt{k^2-1} = \sqrt{k+5}$
37. $3\sqrt{y-3} = \sqrt{3y+3}$	38. $2\sqrt{y+7} - \sqrt{y+25} = 0$	• 39. $\sqrt{x^2-9} = \sqrt{x+3}$
40. $\sqrt{x^2+4} = 2\sqrt{x+4}$	41. $\sqrt{13-x^2} = 5-x$	• 42. $x - \sqrt{x+4} = 2$

In 43–50, select the *numeral* preceding the expression that best completes the sentence or answers the question.

43. The solution set of the equation $x = \sqrt{5x+14}$ is

8.49 x 10.99 in

Pg 429:
3-42 ÷ 3

42. $x - \sqrt{x+4} = 2$

$$-\sqrt{x+4} = 2-x$$

$$(\sqrt{x+4})^2 = (x-2)(x-2)$$

$$x+4 = x^2 - 4x + 4$$

$$x^2 - 5x = 0$$

$$x(x-5) = 0$$

$$\cancel{x=0} \quad x-5=0$$

$$x=5\checkmark$$